

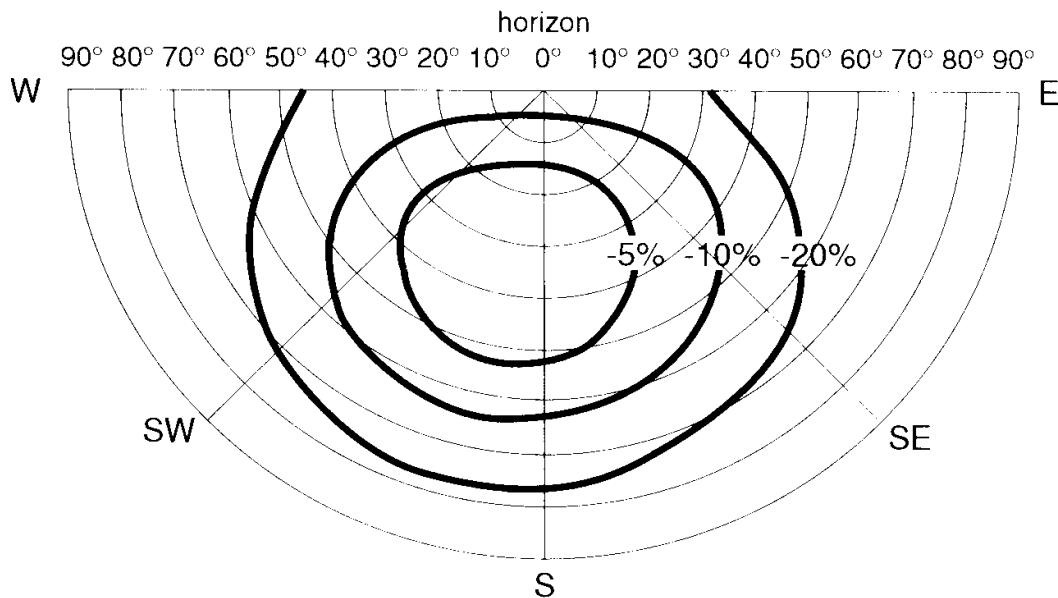
# IMAGINATION SOLAR LTD



## Installation Guide A1

### Planning The Collector Installation

#### Tilt Angle



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### **A1.1 Planning The Collector Installation**

The ISL solar collector is designed for roof integration, but it may also be over-roof mounted, flat roof mounted or wall mounted using dedicated aluminium frames. This means that it is normally recessed into the roof, much like a roof window such as a Velux. It is designed to fit exact multiples of most new interlocking tiles, with no tile cutting. For staggered tiling or slating styles (as shown in figure 2) tile cutting or the use of half tiles is required. The collector is supported by the existing tile battens, with extra strips of wood supporting the top and bottom edge. Flashing is provided by a piece of lead along the bottom edge of the collector and a moulded channel on the vertical edges, to which tiles are overlaid on a rubber sealing flap.

Installation guides A2, A3 and A4 describe all mounting methods.

### **A1.2 Planning before installing the collector (roof integrated)**

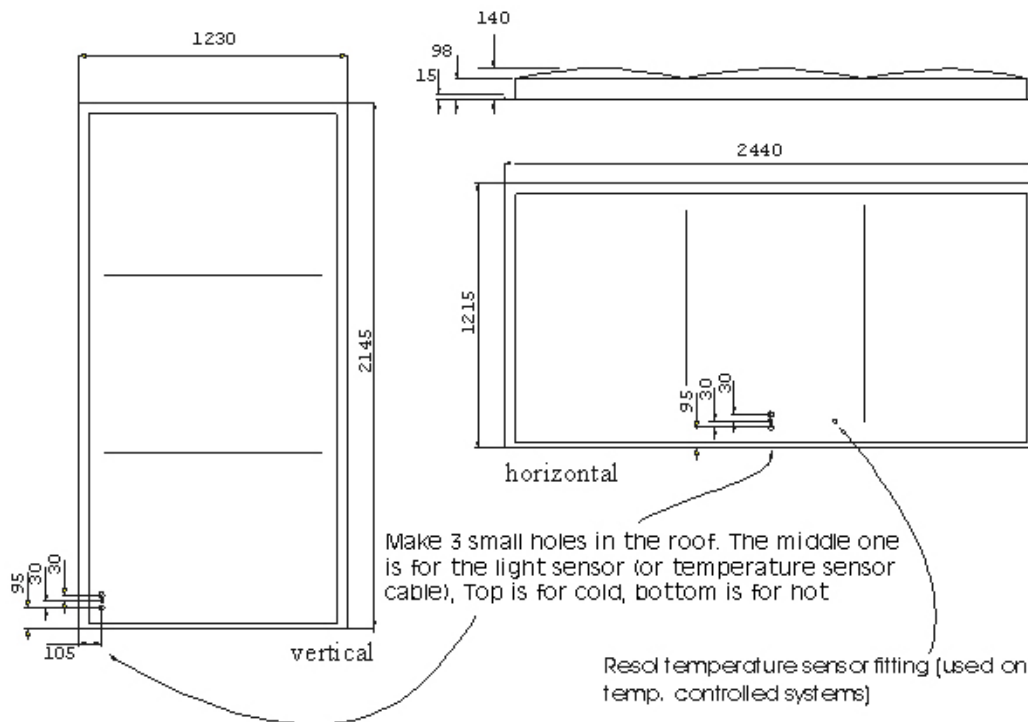
1. Select the most southerly facing and unshaded area of the roof for integration of the collector. Collectors can be mounted on west or east facing roofs but this will result in a lower energy gain than a southerly orientation. (See diagram Tilt/Orientation on following page)
2. Roof Pitch must be 25 degrees or steeper to ensure drainback (or else use and maintain antifreeze).
3. Ensure that there will be enough space to fit the collector (see figure 1 for collector dimensions). For ease of flashing it is preferable to have at least one column of tiles between the collector and a vertical edge.
4. Be aware of the movement of shadows across the proposed location from chimneys, trees etc. and attempt to minimize any potential shading.
5. Ensure there will be access to the rear of the collector from inside the roof space for connecting pipes and the light sensor. This generally means installing the collector high on the roof rather than too near the eaves.
6. Consider the location of the collector in relation to the hot water cylinder. To ensure the greatest efficiency the pipe runs between the collector and the cylinder should be as short as possible.
7. Pipes from the back of the collector should have a continual downwards gradient of 1:20 minimum or more to the drain back vessel, to allow complete drain-back to occur. The location of the collector may affect this. Do not put the collector so low down the roof that it is not possible to get the required gradient in the loft space. If this is not possible anti-freeze must be added to the solar water circuit and maintained.
8. Note that there are two types of collector, vertical and horizontal. The dimensions of these collectors are slightly different and they must be orientated as specified i.e. a horizontal collector cannot be fitted vertically and vice versa.
9. Often the best position, technically and aesthetically, is high up in the centre of the roof.
10. The collector/roof needs to be flat. Older roofs have often formed a concave shape; this can cause drainage problems from the collector top guttering. Check for flatness with a straight edge and pack out the top edge if necessary to make it flat, or even very slightly convex.
11. If there is no roofing felt, or existing felt is in poor condition, it is essential to add a new layer of felt below the solar collector at least 200mm oversized all round.
12. Printed on the top of the cardboard delivery box is a template that can be used to help position the collector on the roof.
13. Tile and a halves may be required – see guide A2 for details
14. Be very aware of material containing asbestos, including corrugated asbestos sheeting, artificial slates and artex ceiling finishes. It is recommended that a CDM plan (Construction Design and Management Regulations 2007) is made to deal with any such materials found on site.

**NOTE: It is important for all installers, no matter how experienced, to familiarise themselves with the latest installation guides before any work commences.** Equipment not installed as per these instructions will not be guaranteed. The guides are written as to explain in detail how to install an ISL system, and where applicable prioritise the order of work to be done. Ring for advice if it's not in the installation guide.

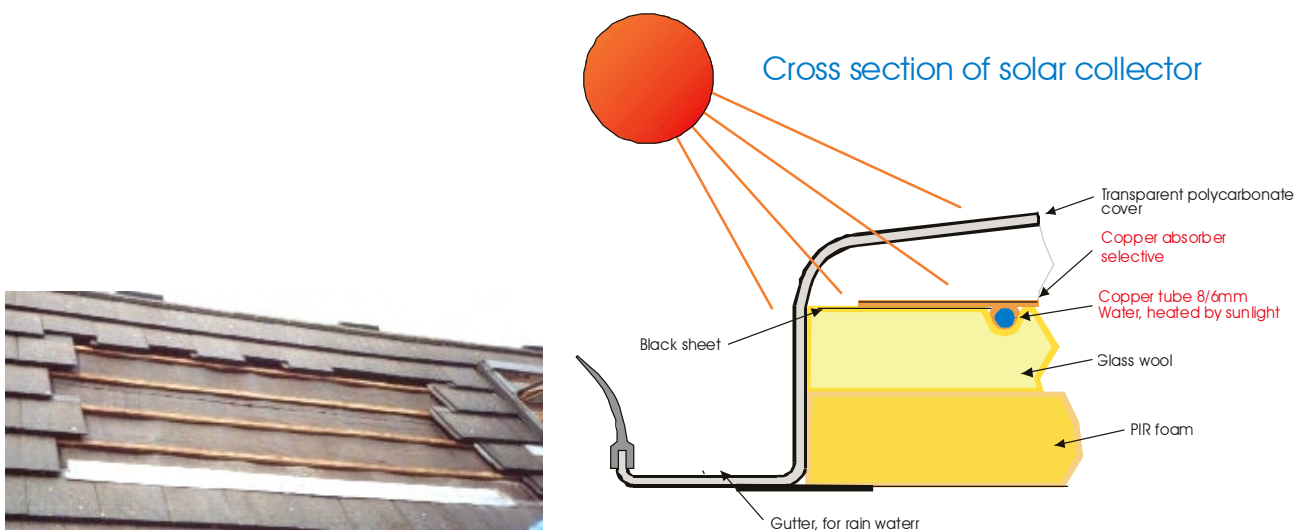
**It is also advisable to spend time PLANNING before starting the job.** A well thought out collector position will make roofing much easier, and consideration of the drain back system before positioning the collector will ensure that everything works properly.

### A1.3 Gaining access to the roof

The ideal time to install the collector is during roof repairs, maintenance or initial building, when scaffolding is already up. If this is occurring, it is worth installing the collector at this time, even if the plumbing is not to be done until much later. However, if this is not an option, a double width scaffold tower may be used. Scaffold towers and two roof ladders are recommended as they make the job much quicker and safer, especially if the tiles need cutting with an angle grinder. A scaffold tower can usually be hired for around £50 and takes about an hour to put up. The collector only weighs 25kg so weight is not a major issue when two people lift it onto the scaffold/roof using a pair of ropes or straps. A risk assessment should be carried out for each installation.



**A1 Figure 1:** Dimensions of a horizontal collector, also showing location of the 3 holes required through the roof. Note vertical collectors can be supplied with the holes required on the left or right hand side. If you have a vertical collector, confirm which type you have before drilling holes in the roof!



**A1 Figure 2:** Roof Integration Details

## A1.4 Technical Information

### SOLAR COLLECTOR

Collector Area:	2.7m <sup>2</sup>	Selective Layer:	Chromium oxide
Length/Width:	H.2440x1215mm V.1230x2415mm	Absorption:	96%
Weight:	25kg	Emission:	8%
Cover:	Polycarbonate	Insulation:	25mm Glass wool 25mm polyurethane
Light Transmission:	90%	Volume:	0.7litres water
Material Absorber:	Copper		

### Extra materials that may be required











Length of 300 - 400mm wide code 4 lead (3m for horizontal collector, 1.5m for vertical collector) 300mm lead is cheaper but 400mm lead gives more adjustment to collector height and can eliminate tile cutting for top edge.	
Flat head copper nails to secure lead flashing	
Leadmate sealant for bottom edge of collector.	
Patination oil for lead to prevent streaking	
Timber batten (50x25mm) to support top edge and tiles. (2 off)	
Timber batten (50x25mm) to support bottom edge of collector and lead. (6-8 off)	
Feather edge board to support lead flashing	
Galvanised roof nails eg. 50mm	
Stainless steel 2" screws to fit narrow tiles	
Roofing felt if existing is in poor condition or absent	
Noggings (100x50mm timber) to support collector edges (slate roofs)	
Slate hooks for making good loose slates (slate roofs)	
Noggings (100x50mm timber) to support (over roof mounting frame)	

It is recommended that all installers carry extra equipment as spares to cover all eventualities. Whilst this may cost capital in investment it will save them money when they find they need something on site and have to drive around for an hour finding bits and pieces.

### Special tools that may be required

Lead dresser for roof integrated collector  
 Angle grinder for tile cutting  
 Slate cutter for slate cutting  
 8mm hex driver for over roof frame and flat roof frame assembly

**Photos of installation details (superceded style, same dimensions)**

		
<p>Horizontal collector on an interlocking pantile roof. No tile cutting required.</p>	<p>Vertical collectors with PV modules on an interlocking pantile roof. No tile cutting required.</p>	
		
<p>Lowering collector to support clips &amp; flashing. Note pipes behind collector</p>	<p>Detail of flashing on bottom edge.</p>	<p>Cutting and laying plain tiles flat on the side edge.</p>
		
<p>Overlaying interlocking plain concrete tiles onto the side of the collector when grinding of tiles is required. Rubber trim not shown. Tiles have been cut to size and ground to lie flat on rubber trim.</p>		
		
<p>Top edge of collector prior to fitting supporting batten and rubber trim.</p>	<p>Finished top and side edge.</p>	

**Slate Installation Details**

<p>On slate roofs the battens are cut out to recess the collector</p>	<p>Cutting slits in the rubber to fit the clips through</p>	<p>A bent fixing clip adjusted for the extra recess depth</p>
<p>A trimmed rubber seal allows the slate to lie flat</p>	<p>Use of a lead strip rather than a course of slates to run to the ridge</p>	<p>Use of a straight edge to check for a flat top gutter</p>

**On-Roof Mounted Installation**



**Side view showing current collector design from October 2006**